What is Claimed Is:

1. A regeneration device for a filter which traps particulate matter in an exhaust gas of an engine, comprising:

a sensor which detects an engine running point containing an engine load,

a controller comprising a map which defines a low load region relating to engine running points, the controller being programmed to:

compute a deposition amount of particulate matter in the filter,

determine whether or not the detected engine running point is in the low load region referring to the map, when the deposition amount of particulate matter is more than a first reference amount,

immediately start a first filter regeneration control by raising a temperature of the exhaust gas, when the detected engine running point is not in the low load region, and

start a second filter regeneration control by raising the temperature of the exhaust gas after the deposition amount of particulate matter exceeds a second reference amount, when the detected engine running point is in the low load region,

wherein the second reference amount is larger than the first reference amount.

2. The regeneration device as defined in Claim 1, wherein the low load region contains one or more engine running points during idle running.

3. The regeneration device as defined in Claim 1, wherein all engine running points of the low load region are engine running points during idle running.

4. The regeneration device as defined in Claim 1, wherein the controller is programmed to compute the deposition amount of particulate matter in the filter based on the detected engine running point.

5. The regeneration device as defined in Claim 1, wherein the second filter regeneration control is a control which balances an amount of particulate matter removed from the filter by combustion and an amount of particulate matter newly flowing into the filter.

6. The regeneration device as defined in Claim 1, wherein the first filter regeneration control is a control which balances an amount of particulate matter removed from the filter by combustion and an amount of particulate matter newly flowing into the filter.

7. The regeneration device as defined in Claim 1, wherein the first filter regeneration control is a control which burns particulate matter completely.

8. The regeneration device as defined in Claim 1, wherein the controller is programmed to determine whether or not an average running point over a predetermined period is in the low load region referring to the map.

9. The regeneration device as defined in Claim 1, wherein the controller is further programmed to:

   determine whether or not an engine running point during the second filter regeneration control is in the low load region by referring to the map, and

   immediately start the first filter regeneration control when the engine running point during the second filter regeneration control is not in the low load region.

10. The regeneration device as defined in Claim 1, wherein the controller is programmed to perform at least one of fuel injection timing control, fuel injection amount control, intake air amount control and auxiliary device load control, so as to raise the temperature of the exhaust gas.

11.   The regeneration device as defined in Claim 1, further comprising a sensor which detects a rotation speed of the engine,

wherein an engine running point is a set of the engine load and the rotation speed.

12. The regeneration device as defined in Claim 1, further comprising a sensor which detects a rotation speed of the engine,

wherein the controller comprises a map which gives a discharge rate of particulate matter based on the engine load and the rotation speed of the engine, and is programmed to compute the deposition amount of the particulate matter in the filter by integrating the discharge rate over time.

13. A regeneration device for a filter which traps particulate matter in an exhaust gas of an engine, comprising:

means for storing a map which defines a low load region relating to engine running points,

means for detecting an engine running point containing an engine load,

means for computing a deposition amount of particulate matter in the filter based on the detected engine running point,

means for determining whether or not the detected engine running point is in the low load region referring to the map, when the deposition amount of particulate matter is more than a first reference amount,

means for immediately raising a temperature of the exhaust gas, when the detected engine running point is not in the low load region, and

means for raising the temperature of the exhaust gas after the deposition amount of particulate matter exceeds a second reference amount, when the detected engine running point is in the low load region,

wherein the second reference amount is larger than the first reference amount.

14. A regeneration method for regenerating a filter which traps particulate matter in an exhaust gas of an engine, comprising:

storing a map which defines a low load region relating to engine running points,

detecting an engine running point containing an engine load,

computing a deposition amount of particulate matter in the filter based on the detected engine running point,

determining whether or not the detected engine running point is in the low load region referring to the map, when the deposition amount of particulate matter is more than a first reference amount,

immediately raising a temperature of the exhaust gas, when the detected engine running point is not in the low load region, and

raising the temperature of the exhaust gas after the deposition amount of particulate matter exceeds a second reference amount, when the detected engine running point is in the low load region,

wherein the second reference amount is larger than the first reference amount.